

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A method for forming integrated circuit copper lines, comprising:

forming a trench in a dielectric layer;

forming a first metal layer in said trench using physical vapor deposition and a high atomic number metal wherein said high atomic number metal is selected from a group consisting of Ruthenium, Iridium, and Rhodium;

forming a second metal layer in said trench contacting on ~~over~~ said first metal layer using chemical vapor deposition and a high atomic number metal wherein said high atomic number metal is selected from a group consisting of Ruthenium, Iridium, and Rhodium; and

filling said trench with copper by electroplating copper directly on said second metal layer.

Claim 2 (currently canceled)

Claim 3 (original): The method of claim 1 wherein said forming a first metal layer in said trench comprises forming a Ruthenium layer using a plasma excitation power of 100 to 1000 watts with a DC power of 5KW to 30 KW applied to a sputter metal target.

Claim 4 (original): The method of claim 1 wherein said forming a second metal layer in said trench comprises flowing a vapor containing Ruthenium over a surface heated to between 100°C and 350°C.

Claim 5 (currently amended): The method of claim 1 further comprising forming a third metal layer in said trench contacting on ~~over~~ said second ~~first~~ metal layer and ~~beneath~~ said ~~second metal layer~~ using chemical vapor deposition and ~~a high atomic number metal~~ a metal selected from a group consisting of Ruthenium, Iridium, and Rhodium.

Claim 6 (currently amended): The method of claim 5 further comprising forming a fourth metal layer in said trench contacting ~~over~~ said third metal layer and ~~beneath~~ said ~~second metal layer~~ using chemical vapor deposition and a high atomic number metal.

Claim 7 (original): A method for forming integrated circuit interconnect copper lines, comprising:

forming a trench in a dielectric layer;

forming a first metal layer in said trench using a plasma excitation power of 100 to 1000 watts with a DC power of 5KW to 30 KW applied to a sputter metal target comprising Ruthenium;

forming a second metal layer in said trench over said first metal layer wherein said forming a second metal layer comprises flowing a vapor containing Ruthenium over a surface heated to between 100°C and 350°C.; and

filling said trench with copper by electroplating copper directly on said second metal layer.

Claim 8 (original): The method of claim 7 wherein said first metal layer is less than 50Å thick.

Claim 9 (original): The method of claim 7 further comprising forming a third metal layer in said trench over said first metal layer and beneath said second metal layer using chemical vapor deposition and a high atomic number metal.

Claim 10 (original): The method of claim 9 further comprising forming a fourth metal layer in said trench over said third metal layer and beneath said second metal layer using chemical vapor deposition and a high atomic number metal.

Claim 11 (currently canceled)

Claim 12 (currently canceled)

Claim 13 (currently canceled)

Claim 14 (currently canceled)

Claim 15 (currently canceled)

Claim 16 (currently canceled)

Claim 17 (original): A method for forming circuit copper lines, comprising:

forming a trench in a dielectric layer;

forming a first metal layer in said trench using physical vapor deposition and a high atomic number metal;

exposing said first metal layer to a plasma treatment;

forming a second metal layer in said trench over said first metal layer using chemical vapor deposition and a high atomic number metal; and

filling said trench with copper by electroplating copper directly on said second metal layer.

Claim 18 (original): The method of claim 17 wherein said forming a first metal layer in said trench comprises forming a Ruthenium layer using a plasma excitation power of 100 to 1000 watts with a DC power of 5KW to 30 KW applied to a sputter metal target.

Claim 19 (original): The method of claim 18 wherein said forming a second metal layer in said trench comprises flowing a vapor containing Ruthenium over a surface heated to between 100°C and 350°C.

Claim 20 (original): The method of claim 19 wherein said plasma treatment comprises exposing said first metal layer to a plasma with excitation power levels of less than 1000 Watts.

Claim 21 (original): The method of claim 20 further comprising forming a third metal layer in said trench over said first metal layer and beneath said second metal layer using chemical vapor deposition and a high atomic number metal.

Claim 22 (original): The method of claim 21 further comprising forming a fourth metal layer in said trench over said third metal layer and beneath said second metal layer using chemical vapor deposition and a high atomic number metal.

Amendments to the Drawings:

None